BEVERLY AND KAMINURIAK CARIBOU MONITORING AND LAND-USE CONTROLS

1981

HEATHER CLEMENT

N.W.T. WILDLIFE SERVICE

RANKIN INLET, N.W.T.

1982

Progress Report No. 6

ABSTRACT

Beverly and Kaminuriak barren-ground caribou (Rangifer tarandus groenlandicus) movements were monitored from 10 May to 31 July 1981 in relation to the Caribou Protection Areas and land-use activities. The Caribou Monitor advised DIAND (Department of Indian Affairs and Northern Development) Land-use Inspectors on cow-calf distribution in areas of proposed land use activity. Aerial reconnaissance was the primary monitoring method. The Beverly cows were observed on the calving ground by 23 May. Post-calving movements began by mid-June; by 13 July the entire Beverly Caribou Protection Area was released for land-use activity. Seven land-use permits were issued to companies and agencies working within the Beverly Caribou Protection Area during the monitoring period. The Kaminuriak cows were on the calving ground by 29 May. Post-calving movements began in mid to late June. Three land-use permits were issued to companies working within the Kaminuriak Caribou Protection Area during the monitoring period. As a result of the Caribou Protection Measures and the Monitoring Program, potential caribou - land-use conflicts were avoided.

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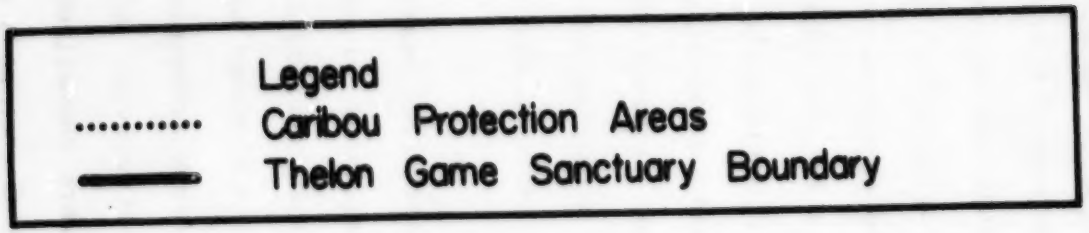
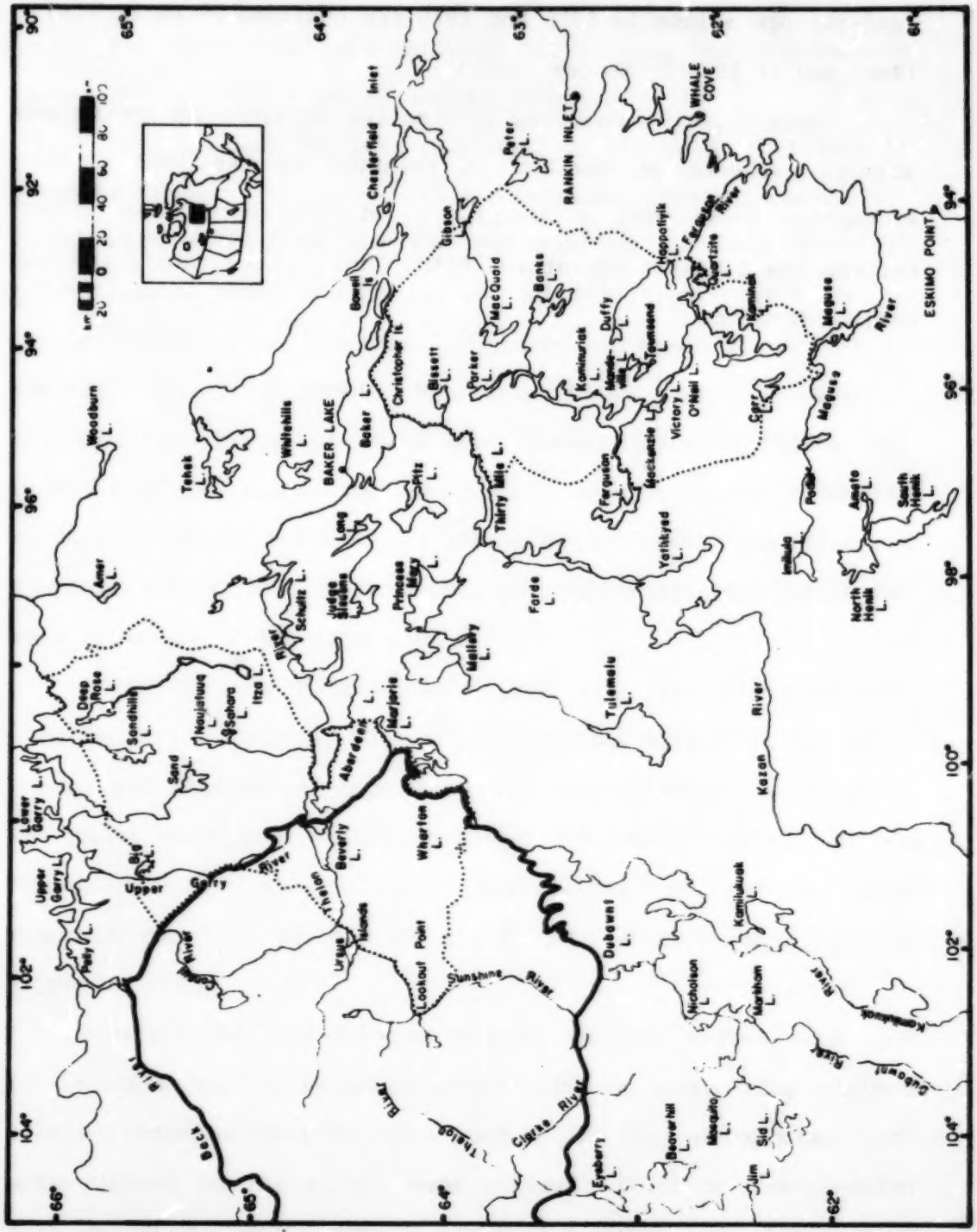
INTRODUCTION

The 1981 Caribou Monitoring Program was conducted for the fourth consecutive year for calving and post-calving barren-ground caribou (Rangifer tarandus groenlandicus) of the Beverly and Kaminuriak herds. The purpose of this program was to protect cows and calves during critical periods and to facilitate land-use permit activities by releasing all or parts of protection areas in the absence of cows. The objective of the program was to advise DIAND Land-use Inspectors on the implementation of the Caribou Protection Measures by monitoring the spring and summer distribution of Beverly and Kaminuriak cows and calves in relation to "protection areas" and proposed land-use permit activities. The Caribou Monitor was requested to advise on the release of areas for land-use operations any time between 15 May and 31 July 1981.

The 1981 Caribou Protection Measures (Appendix I) were used to regulate land-use operations within the Caribou Protection Areas (Fig. 1) and to protect caribou during spring migration and throughout the summer at designated water crossing sites. The 1981 Caribou Protection Areas encompassed the known traditional calving grounds and post-calving areas of the Beverly and Kaminuriak herds, which were summarized and delineated by Darby (1980). The calving grounds encompass all areas where parturient cows of each herd have been known to calve, while a calving ground is an area where parturient cows concentrate to calve in any one year (Fleck and Gunn 1982). The measures are designed to minimize or eliminate disturbance of caribou from land-use activities

Figure 1. The Study Area of the 1981 Caribou Monitoring Program.




BAKER LAKE
RANKIN INLET
WHALE COVE
ESKIMO POINT
Chesterfield Inlet
Back River
Thelon River
Kazan River
Dubawnt River
Sunshine River
Clarke River
Lookout Point
Woodburn L.
Amer L.
Tehek L.
Wilmot Is.
Baker L.
Bowell Is.
Christopher Is.
Bissett L.
Parker L.
Gibson L.
MacQuoid L.
Peter L.
Banks L.
Kominuriak L.
Duffy L.
Stonestreet L.
Happolityk L.
Quartzite L.
Victory L.
O'Neil L.
Ferguson L.
Mackenzie L.
Tirrity Mile L.
Pitz L.
Long L.
Judge Sissons L.
Princess Mary L.
Schultz L.
Schultz River
Forde L.
Yathkyed L.
Malliday L.
Tulemalu L.
Deep Rose L.
Sandhill L.
Naujaluvq L.
Sahara L.
Iza L.
Sand L.
Lower Garry L.
Upper Garry L.
Big L.
Upper Garry River
Aberdeen L.
Marjorie L.
Beverly L.
Thelon River
Wharton L.
Urquhart Islands
Dubawnt L.
Kamilukuak L.
Nicholson L.
Markham L.
Beaverhill L.
Mosquito L.
Sid L.
Jim L.
Eyberry L.
Ingilak L.
Porter L.
Amsto L.
South Henik L.
North Henik L.
Magusa L.
Magusa River
Kaminak L.
Kaminak River
Schultz L.
Parker L.
Ferguson L.
Mackenzie L.
Victory L.
O'Neil L.
Stonestreet L.
Duffy L.
Kominuriak L.
Banks L.
MacQuoid L.
Gibson L.
Bissett L.
Christopher Is.
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Wilmot Is.
Tehek L.
Woodburn L.
Amer L.
Deep Rose L.
Sandhill L.
Naujaluvq L.
Sahara L.
Iza L.
Sand L.
Lower Garry L.
Upper Garry L.
Big L.
Beverly L.
Wharton L.
Dubawnt L.
Kamilukuak L.
Nicholson L.
Markham L.
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Princess Mary L.
Schultz L.
Forde L.
Yathkyed L.
Malliday L.
Tulemalu L.
Marjorie L.
Aberdeen L.
Wharton L.
Beverly

during calving and post-calving periods. Measures applied to land-use operations in 1978 and 1979 are outlined by Darby (1979, 1980) and in 1980 by Cooper (1981).

This report summarizes information obtained on spring and summer movements of caribou in relation to the 1981 Caribou Protection Areas with a description of the cooperative effort between the land-use operators, DIAND land-use personnel, and the Caribou Monitor.

STUDY AREA AND METHODS

The monitoring area included the calving and post-calving ranges of the Beverly and Kaminuriak herds (Fig. 1).

The Caribou Monitor followed procedures outlined in Appendix II and techniques described by Darby and Williams (1979). Areas were monitored for the presence of cow and cow-calf concentrations prior to, during, and after calving in an effort to detect movements or continued occupancy in order to respond to specific concerns of DIAND. Monitoring flights were conducted in a DeHavilland Beaver on wheel-skis, tundra tires or floats, and from a Bell Jet Ranger 206 Helicopter. Monitoring was conducted at an altitude of 300 m a.g.l. (above ground level) and at an air speed of 170 km/hr. Twenty-five monitoring flights (103.1 hr) were flown during the 1981 program.

The Caribou Monitor organized the flights, observed, recorded all sightings, photographed caribou with a 35 mm reflex camera and documented human activity observed while on flights. The pilot made incidental sightings and the Assistant Caribou Monitor acted as an observer. Observations were recorded on a standard form and plotted on a 1:250,000 scale topographic map (Appendix III).

During the post-calving movement period, calves were used to indicate the presence of cows. In addition, many caribou trails (including some of those used during the spring migration) were plotted on the flight maps at their point of intersection with the flight path. Some heavily used trails were followed to determine the location of the caribou. The trails of migrating

caribou are visible from the air, particularly on moist ground, snow, or on new vegetation growth.

Interviews and discussions with Inuit hunters, pilots, biologists and exploration company personnel supplemented the information base by providing additional data on caribou distribution and movements. Following each flight, the Monitor verbally outlined observations to the DIAND Land-use Inspector in Baker Lake and followed-up with a written report. In addition, 3 monthly summary reports were submitted. All reports are on file at the N.W.T. Wildlife Service, Regional Office in Rankin Inlet.

RESULTS AND DISCUSSION

Beverly Caribou Movements and Distribution

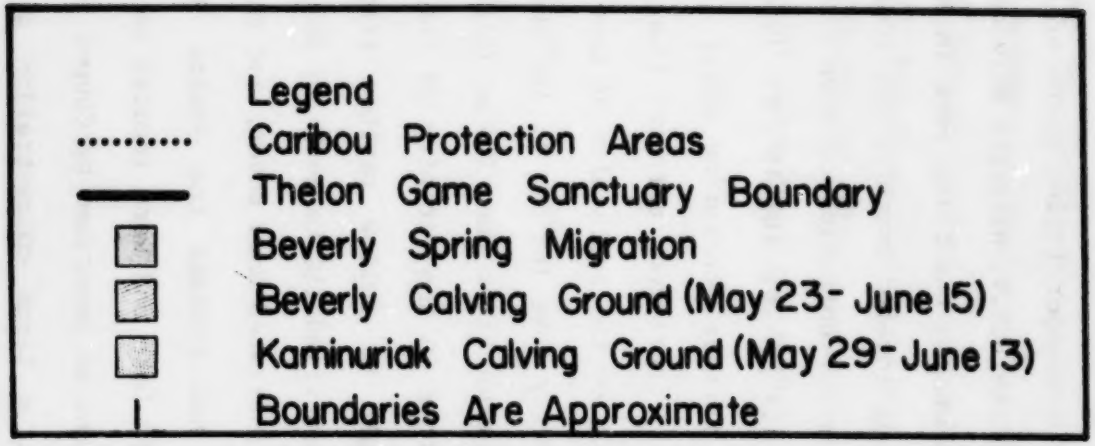
Spring Migration Toward the Calving Ground

R. Catling, a trapper living north of Jim Lake (62°24' N, 104°35' W), advised the N.W.T. Wildlife Service of the movement of cows past his camp during the first week in May (R. Decker pers. comm.). This area is located south of the Thelon Game Sanctuary.

On 16 May, a concentration of cows was observed southeast of Ursus Islands (64°15' N, 101°45' W) (Table 1). Inclement weather prevented further monitoring until 23 May. On May 23, snow cover gradually increased from less than 40% near the Thelon River to nearly 100% on the south side of Lower Garry Lake (65°52' N, 99°36' W) and Pelly Lake (65°55' N, 101°20' W); open water was observed on the Thelon River near Ursus Island. Knoll tops and eskers were snow-free in the vicinity of the Thelon River, thus making it difficult to follow caribou trails. Trails were, however, easily identified 110 km north of Beverly Lake (64°36' N, 100°30' W) due to increased snow cover, and these trails were then monitored. Cows had crossed the Thelon River between Ursus Islands and Beverly Lake and were located on the western section of the calving ground as described by Cooper (1981) (Fig. 2).

On 24 May, a large concentration of cows was observed throughout an area that ranged from Deep Rose Lake (65°44' N, 98°40' W) west to the Upper Garry River (65°44' N, 100°44' W).

Figure 2. Locations of Beverly caribou observed during the 1981 spring migration and while on the calving ground.[1]


Legend
Caribou Protection Areas
Thelon Game Sanctuary Boundary
Beverly Spring Migration
Beverly Calving Ground (May 23- June 15)
Kaminuriak Calving Ground (May 29- June 13)
Boundaries Are Approximate

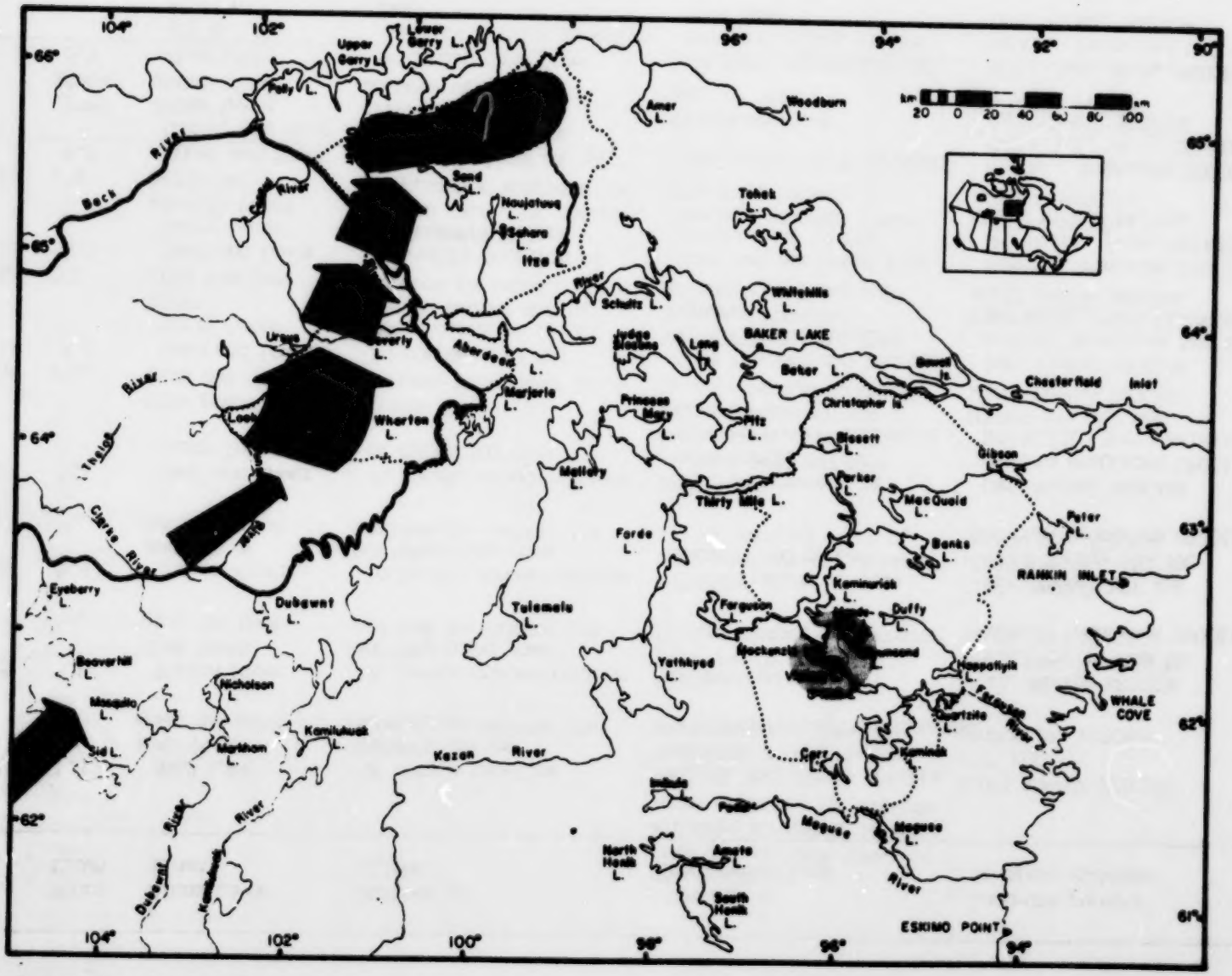

Upper Garry L.
Lower Garry L.
Polly L.
Back River
Amer L.
Woodburn L.
km 20 0 20 40 60 80 100
Sand L.
Naujatuuq L.
Sphere L.
Itse L.
Tehek L.
Whitehills L.
Schultz L.
BAKER LAKE
Baker L.
Chesterfield Inlet
Christopher Is.
Bissett L.
Gibson
Parker L.
MacQuoid L.
Peter L.
Banks L.
RANKIN INLET
Kaminuriak L.
Duffy L.
Ferguson L.
Hoppotyik L.
WHALE COVE
Aberdeen L.
Marjorie L.
Wharton L.
Princess Mary L.
Pitz L.
Mallery L.
Thirty Mile L.
Forde L.
Tulemalu L.
Yathkyed L.
Eyebery L.
Dubawnt L.
Beaverhill L.
Nicholson L.
Mosquito L.
Sid L.
Matthew L.
Kamilukuak L.
Kazan River
Corr L.
Kaminak L.
Mugaa L.
North Henik L.
Angle L.
South Henik L.
ESKIMO POINT
104°
102°
100°
98°
96°
94°
92°
90°
66°
65°
64°
63°
62°
61°

Table 1. Caribou monitoring flights for the Beverly Caribou Protection Area, 1981.

Date	Hours flown	Areas to be flown	Purpose of flight	Results and recommendations	Land-use permits in areas surveyed
May 10	1.8	Sand Lake	To obtain baseline data on spring migration	Flight aborted at Schultz Lake due to inclement weather; no caribou observed	
May 15	3.8	Thelon River	To locate concentrations of migrating cows	No caribou observed	Can. Nickel N81C456 Mobil Energy N80C390 Westmin Resources N80C412
May 16	5.4	Thelon River	To locate concentrations of migrating cows	Concentration of cows located and mapped	Can. Nickel N81C456 Mobil Energy N80C390 Westmin Resources N80C412
May 23	5.1	Sand and Lower Garry Lakes	To locate concentrations of migrating cows	Tracked movement of cows north; flight aborted due to inclement weather	Can. Nickel N81C456 Westmin Resources N80C412 NWT Wildl. Serv. N81H495
May 24	4.6	Sand and Lower Garry Lakes	To complete 23 May reconnaissance flight	Cows tracked and located on potential calving ground	Can. Nickel N81C456 Westmin Resources N80C412 NWT Wildl. Serv. N81H495
May 28	3.5	Sand and Lower Garry Lakes	To verify location of cow concentrations	Cows had not moved from position of 24 May	Westmin Resources N80C412 NWT Wildl. Serv. N81H495 Can. Nickel N81C456
June 3	6.8	Upper and Lower Garry, and Deep Rose Lakes	To verify location of cow concentrations	Cows calving; no movement	Westmin Resources N80C412 NWT Wildl. Serv. N81H495 Can. Nickel N81C456
June 12	2.2	Itza Lake (65°02' N, 98°27'W)	To obtain data from Wildlife Service research camp	Obtained information on cows and calves at Deep Rose Lake	NWT Wildl. Serv. N81H495 Westmin Resources N80C412 Can. Nickel N81C456

Table 1. continued

Date	Hours flown	Areas to be flown	Purpose of flight	Results and recommendations	Land-use permits in areas surveyed
June 15	5.8	Pelly and Beverly Lakes	To determine southern and western extent of cow-calf concentrations	Scattered pockets of cow-calf concentrations	Cominco N80C225 Marline N80C277
June 25	5.1	Itza and Sand Lakes	Response to request for release and to obtain data	Probable post-calving movement observed northeast of Sand Lake	Mobil Energy N80C390 NWT Wildl. Serv. N81H495
June 28	3.8*	Sand and Deep Rose Lakes	Response to request for release	No release recommended; major concentrations of cows-calves observed between Sand and Deep Rose Lakes	Mobil Energy N80C390 Hudson Bay N81C454
July 4	7.2*	Sand and Deep Rose Lakes	Response to request for release	Flight aborted north of Sand Lake due to inclement weather	Hudson Bay N81C454 Mobil Energy N80C390 U.G.** N80C217
July 5	3.6*	Sand and Deep Rose Lakes	Response to request for release	Flight aborted at Aberdeen Lake due to inclement weather	Hudson Bay N81C454 Mobil Energy N80C390 U.G. N80C217
July 6	4.8	Sand and Deep Rose Lakes	Response to request for release	Recommended release of Deep Rose Lake and area east of Sand Lake; recommendation for release withheld northeast of Sand Lake due to large cow-calf concentration	Hudson Bay N81C454 U.G. N80C217 Mobil Energy N80C390

Table 1. continued

Date	Hours flown	Areas to be flown	Purpose of flight	Results and recommendations	Land-use permits in areas surveyed
July 13	3.8	Sand and Big Lakes	Response to request for release	No caribou observed; recommended release	Mobil Energy N80C390 Union Oil N80C242 Texasgulf N81C506
Total	67.3				

* DIAND helicopter used

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Beverly Caribou Calving

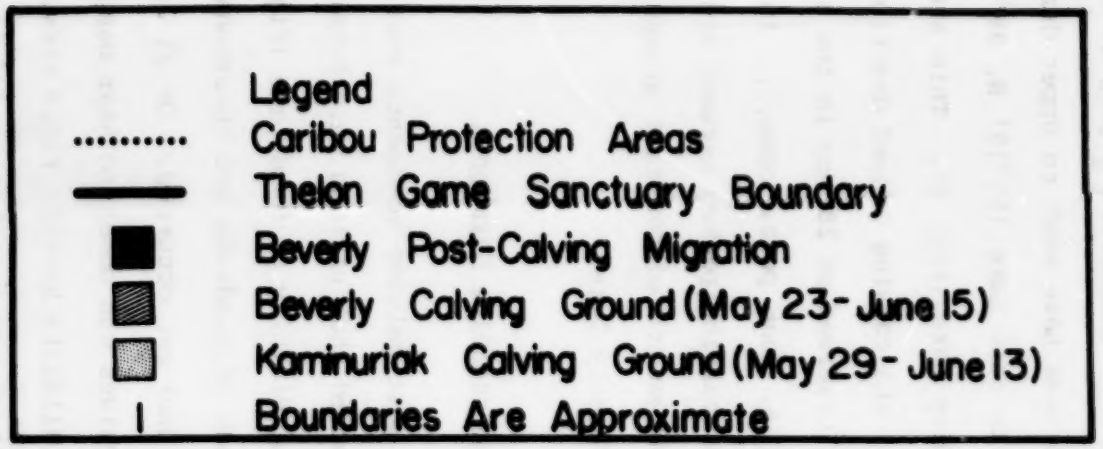
Large concentrations of Beverly cows were observed on the calving grounds by 23 May. Although the 1981 calving ground was not delineated, cows were observed within an elongated area which extended from Deep Rose Lake west to Upper Garry River (65°50' N, 100°48' W), south to Sand Lake (65°15' N, 99°37' W) and north to Upper and Lower Garry Lake (Fig. 2). This area is located on the northern section of the calving ground described by Cooper (1981).

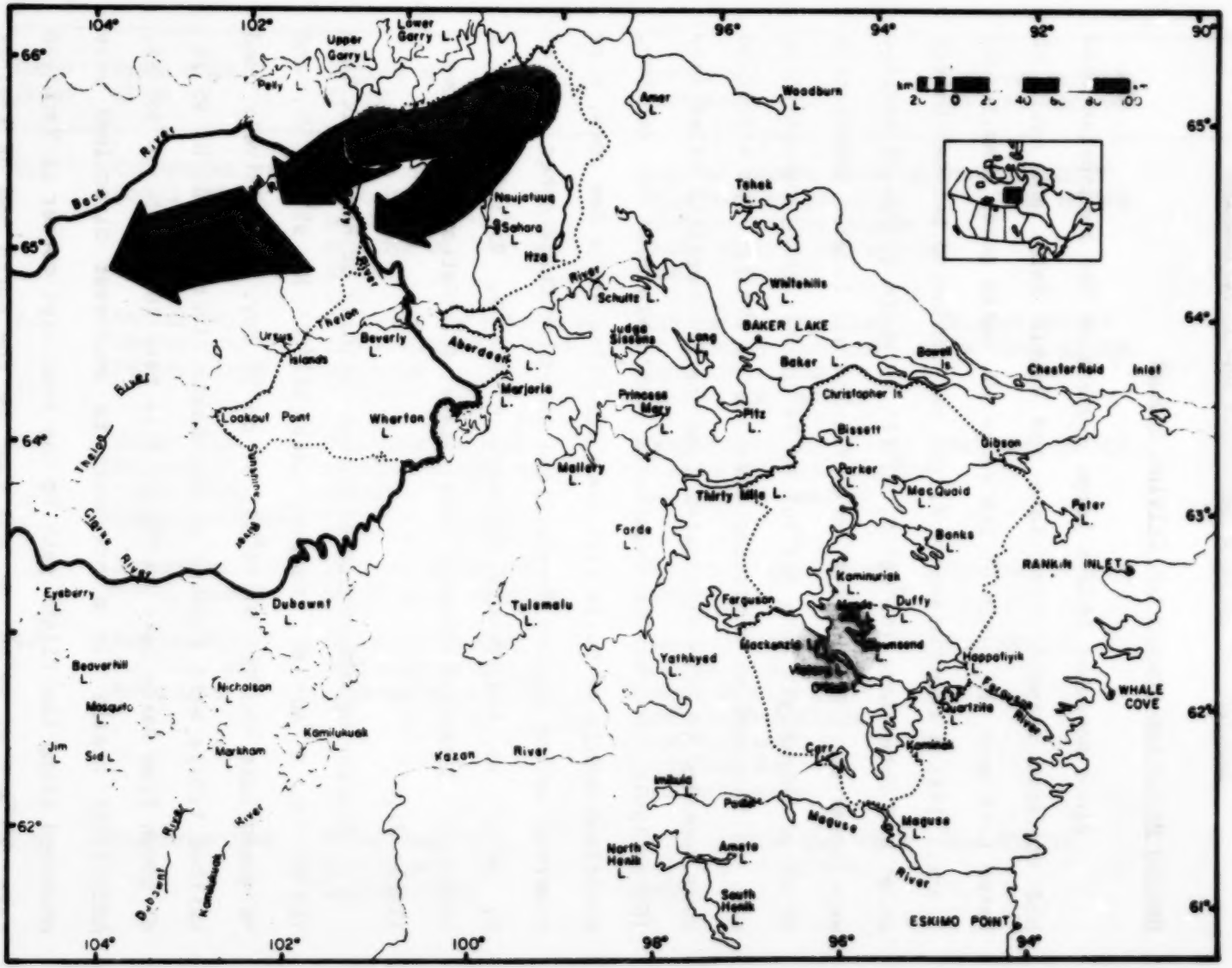
Calves were observed on 28 May in the area of Sand Lake and Lower Garry Lakes (A. Gunn pers. comm.). In the Deep Rose Lake and Sand Lake area, calving peaked between 3-8 June (A. Gunn pers. comm.). On 15 June scattered cow-calf groups were observed north and northwest of Beverly Lake.

Beverly Caribou Post-calving Movements

On 15 June post-calving movements were not evident. On 18 June Dr. Gunn reported that caribou were forming into post-calving aggregations in the vicinity of Sand Lake (Fig. 3). Some aggregations were comprised of hundreds and thousands of cows and calves. No major movement had yet occurred. On 24 June a large aggregation of cows and calves was observed near Deep Rose Lake by a member of the N.W.T. Wildlife Service field crew. These aggregations were still present during monitoring flights on the 25 and 28 June. In addition, an aggregation of cows and calves was observed on the south side of Sandhills Lake (65°22' N, 99°10' W) on 28 June. No caribou were observed on 13 July around Sand Lake and Big Lake (65°31' N, 100°35' W). The post-calving aggregations had apparently moved out of this area to the west and southwest.

Figure 3. Locations of post-calving Beverly caribou observed during the 1981 Monitoring Program.[1]


Legend
Caribou Protection Areas
Thelon Game Sanctuary Boundary
Beverly Post-Calving Migration
Beverly Calving Ground (May 23 - June 15)
Kaminuriak Calving Ground (May 29 - June 13)
Boundaries Are Approximate


104°
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61°
Upper Garry L.
Lower Garry L.
Poty L.
Back River
Amer L.
Woodburn L.
Tehek L.
Naujatuuq L.
Sahara L.
Hzo L.
Schultz L.
Whitehills L.
BAKER LAKE
Judge Sissons L.
Long L.
Baker L.
Bowell Is.
Chesterfield Inlet
Christopher Is.
Princess Mary L.
Fitz L.
Bissett L.
Gibson
Parker L.
MacQuoid L.
Peter L.
Banks L.
RANKIN INLET
Kaminuriak L.
Ferguson L.
Duffy L.
Mackenzie L.
Thurmond L.
Happaliyik L.
WHALE COVE
Quartzite L.
Kamilik L.
Carr
Yathkyed L.
Tulemalu L.
Forde L.
Mallery L.
Thirty Mile L.
Aberdeen L.
Marjorie L.
Beverly L.
Ursus Islands
Lookout Point
Wharton L.
Thelon River
Clarke River
Eyeberry L.
Dubawnt L.
Beaverhill L.
Nicholson L.
Mosquito L.
Jim L.
Sid L.
Markham L.
Kamilukuak L.
Dubawnt River
Kamilukuak River
Kazan River
Inkula L.
Pukit
Maguse L.
Maguse River
North Henik L.
Amato L.
South Henik L.
ESKIMO POINT
km
0
40
80
100

Kaminuriak Caribou Movements and Distribution

Spring Migration Toward the Calving Ground

Since November 1980 a large segment of the Kaminuriak herd had wintered between Baker Lake and Rankin Inlet and north of Baker Lake near the limit of its range (C. Gates pers. comm.). On 3 April 1981 a reconnaissance flight was conducted between Rankin Inlet and Peter Lake (63°08' N, 92°48' W) where groups of caribou were observed. The largest concentration was located immediately north of Happotiyik Lake (62°30' N, 94°20' W); this concentration was the vanguard of migrating cows (Gates 1981). The migrating cows appeared to have originated from the Chesterfield Inlet area (Gates 1981). On 15 May scattered concentrations of caribou, comprised mostly of bulls with some juveniles and a few cows, were observed moving across Chesterfield Inlet at Christopher (64°04' N, 94°32' W) and Bowell Islands (63°45' N, 93°31' W) in a southeast direction toward Peter Lake (C. Gates pers. comm.) (Table 2).

Monitoring was conducted in the vicinity of Kaminuriak Lake (63°00' N, 95°40' W), Kaminak Lake (62°10' N, 95°00' W), and Ferguson Lake (62°55' N, 96°53' W) on 25 May. Extensively used caribou trails were located on the Kazan River (64°00' N, 95°28' W) south from Baker Lake to Thirty Mile Lake (63°36' N, 96°30' W). Additional trails (in a northwest to southwest direction) were observed along the flight path to the southeast corner of Yathkyed Lake (62°40' N, 98°00' W) and east to the north end of Kaminak Lake (62°10' N, 95°00' W).

Table 2. Caribou monitoring flights for the Kaminuriak Caribou Protection Areas, 1981.

Date	Hours flown	Areas to be flown	Purpose of flight	Results and recommendations	Land-use permits in areas surveyed
May 15	2.3	Christopher and Bowell Islands	To document ice crossings and to monitor caribou relative to land-use sites	Observed concentrations of bulls and some juveniles and cows crossing islands to the south (C. Gates pers. comm.)	Noranda N80C379 Pan Ocean N81J426
May 25	4.5	Kaminuriak, Kaminak, and Ferguson Lakes	To locate cow concentrations relative to land-use sites	Main cow concentrations not located; scattered sightings of cows and small groups of bulls	Noranda N80C379 Pan Ocean N81J426
May 29	5.1	Thirty Mile, Ferguson, Kaminak, and Kaminuriak Lakes	To locate cow herd relative to land-use sites	Located main body of herd on south end of Kaminuriak Lake; calves observed	Pan Ocean N81J426
June 2	1.2*	Christopher and Bowell Islands	To check on current use of water crossings	Many trails observed and mapped	Pan Ocean N81J426
June 4	4.6	Kaminuriak, Ferguson, and Ameto Lakes	To locate calving herd relative to land-use sites	Cows well dispersed throughout calving ground; heavily used trails mapped; flight terminated north of Duffy Lake due to inclement weather	Esso N80C219
June 10	1.8	Kaminuriak Lake	To relocate cow herd relative to land-use sites	Flight aborted near Kazan Falls due to inclement weather	Esso N80C219

Table 2 continued

Date	Hours flown	Areas to be flown	Purpose of flight	Results and recommendations	Land-use permits in areas surveyed
June 13	6.0	Kaminuriak, Yathkyed, Thirty Mile, and Ameto Lakes	To complete 10 June flight	Located scattered groups of cows and calves near Yathkyed Lake to the south and east	Esso N80C219 U.G.** N80C217
June 27	1.4*	Thirty Mile and Forde Lakes	Land-use monitoring flight	Bull caribou observed; some near U.G. camp at Thirty Mile Lake	U.G. N80C217
June 30	2.1	Kaminuriak, Quartzite and Kaminak Lakes	To monitor area for caribou relative to land-use sites	Bull caribou observed; Flight aborted at north end of Kaminuriak Lake due to mechanical difficulty	Esso N80C219
July 7	6.8	Kaminuriak, Quartzite, Kaminak, and Ameto Lakes	Response to request for release	No caribou observed	Esso N80C219
Total	35.8				

* DIAND helicopter used

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Kaminuriak Caribou Calving Ground

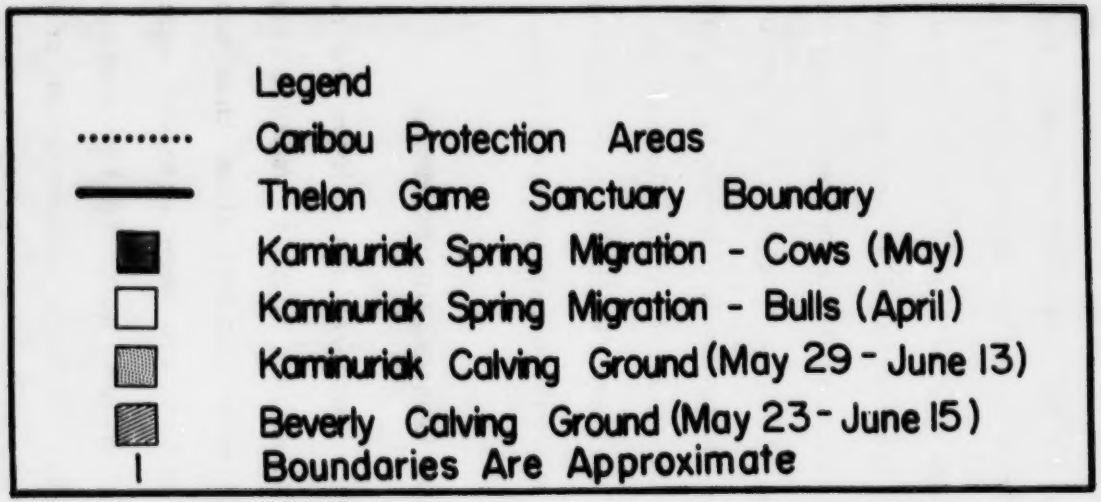
The main body of the calving cows was located along the southwest shore of Kaminuriak Lake on 29 May (Fig. 4). Additional concentrations of cows were observed in the vicinity of Mackenzie Lake (62°39' N, 95°42' W), Victory Lake (62°36' N, 95°31' W), O'Neil Lake (62°42' N, 95°28' W), Townsend Lake (62°42' N 95°21' W), Mandeville Lake (62°42' N, 95°12' W) and Duffy Lake (62°46' N, 95°53' W). Cows near Manderville and Duffy Lakes were moving in a southwest direction toward the concentration of cows located near Kaminuriak Lake. Cows had begun to calve by 29 May, but peak periods were not determined. However, a large concentration of cows and calves was observed on a plateau south of Mackenzie Lake on 4 June. Inclement weather prevented monitoring of the Kaminuriak cows and calves between 4 - 13 June.

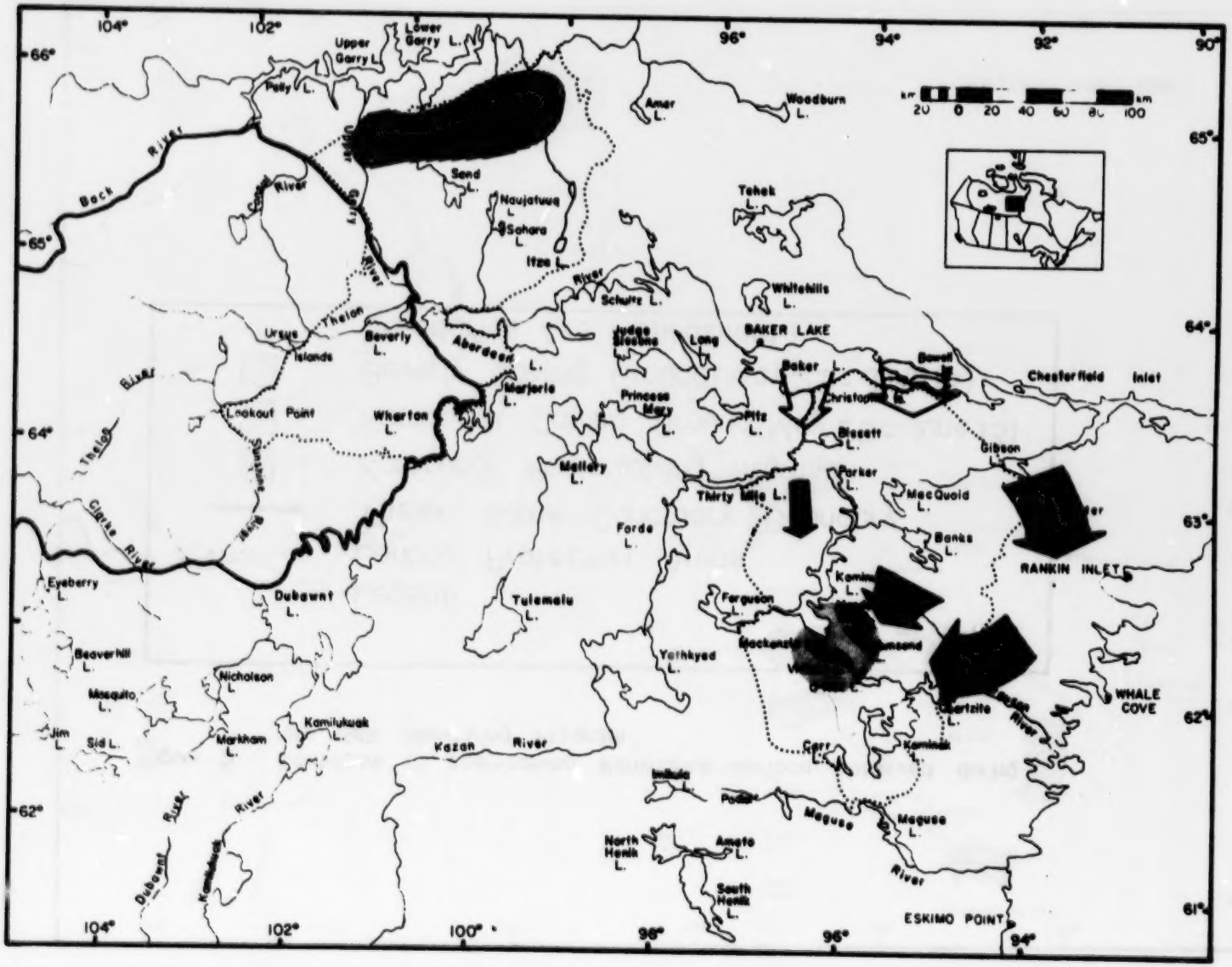
Kaminuriak Caribou Post-calving Movements

On 13 June concentrations of cows and calves were observed east of Yathkyed Lake and south to Imikula Lake (62°02' N, 97°40' W). A few bulls were observed along this monitoring route. In addition, cows and calves were observed east to Ferguson Lake (65°55' N, 96°53' W) and north to the southeast shore of Thirty Mile Lake (Fig. 5). A large concentration of cows and calves was observed in the Quartzite Lake area on 22 June (J. Umpherson per. comm.).

At the end of June an estimated 5,000 caribou were observed 22 km north of Eskimo Point along the Maguse River (61°26' N, 94°24' W). This concentration was comprised primarily of cows

Figure 4. Locations of Kaminuriak caribou observed during the 1981 spring migration and while on the calving ground.[1]


Legend
Caribou Protection Areas
Thelon Game Sanctuary Boundary
Kaminuriak Spring Migration - Cows (May)
Kaminuriak Spring Migration - Bulls (April)
Kaminuriak Calving Ground (May 29 - June 13)
Beverly Calving Ground (May 23 - June 15)
Boundaries Are Approximate


104°
102°
96°
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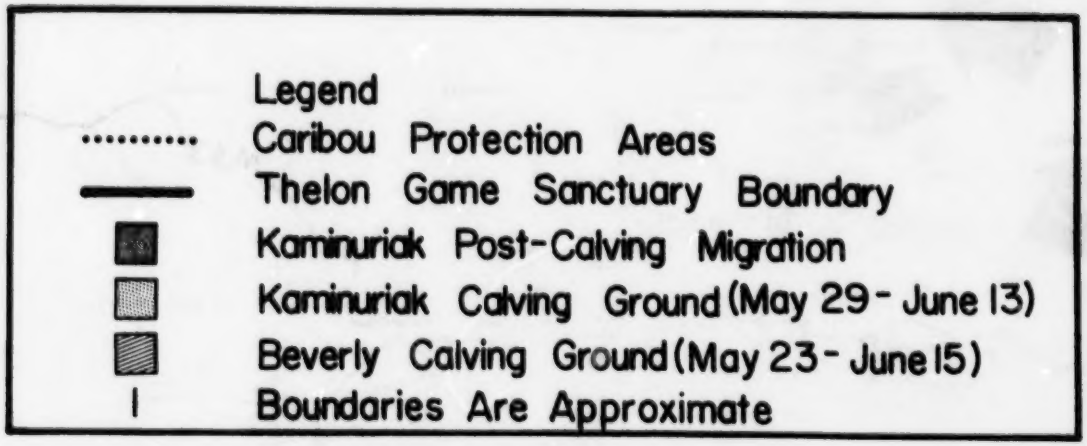
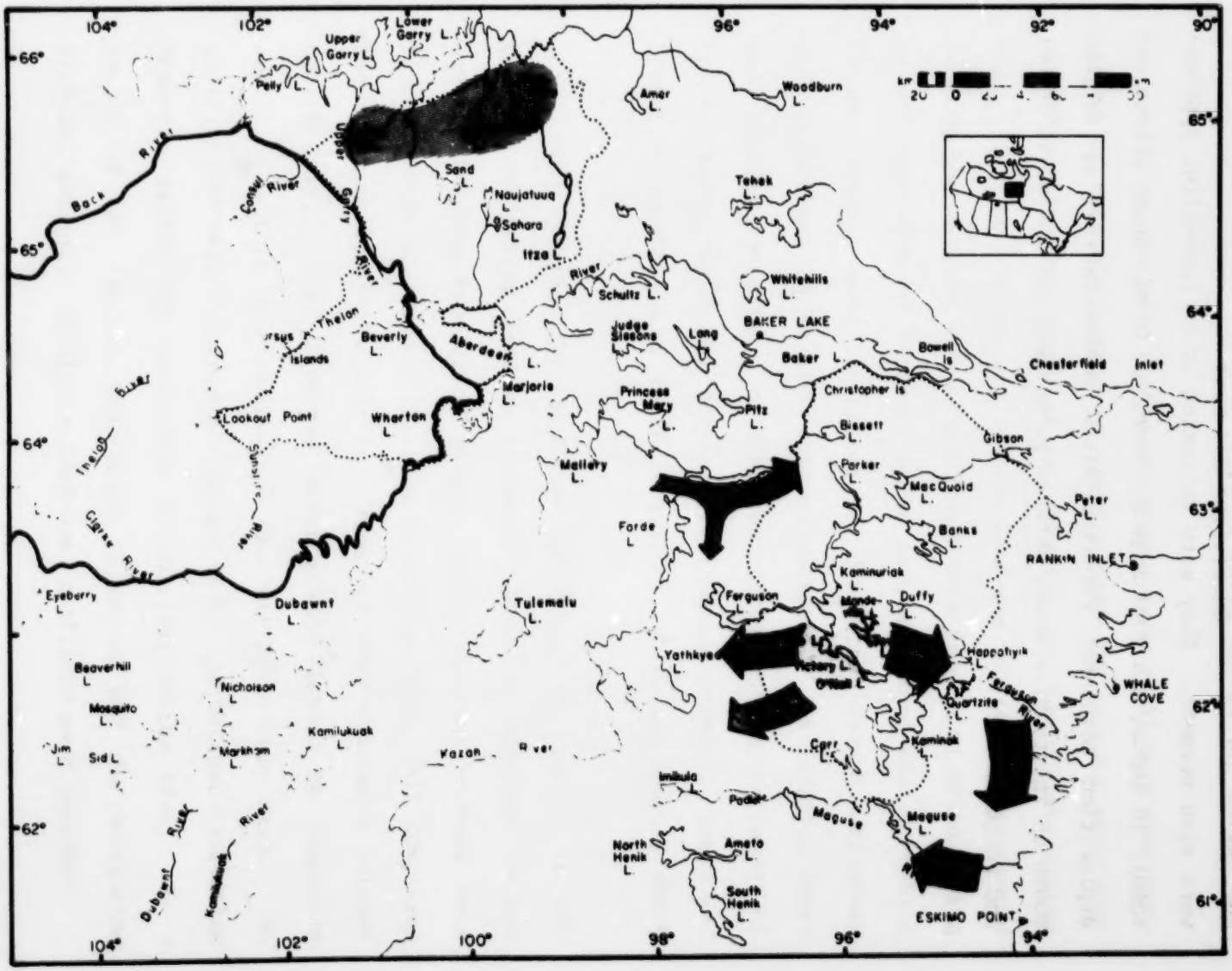
62°
61°
100°
98°
Upper Garry L.
Lower Garry L.
Petty L.
Amer L.
Woodburn L.
km 20 0 20 40 60 80 100 km
Back River
Garry River
Sand L.
Naujatuuq L.
Schara L.
Itza L.
Tehek L.
Whitehills L.
Schultz L.
Ursus Islands
Beverly L.
Aberdeen L.
Judge Sissons L.
Long L.
BAKER LAKE
Baker L.
Bowell L.
Chesterfield Inlet
Marjorie L.
Princess Mary L.
Pitz L.
Christopher L.
Wharton L.
Lookout Point
Thelon River
Clarke River
Sunshine Lake
Mallery L.
Blasett L.
Gibson L.
Parker L.
MacQuoid L.
Thirty Mile L.
Forde L.
Banks L.
RANKIN INLET
Eyeberry L.
Dubawnt L.
Tulemalu L.
Ferguson L.
Kaminak L.
Beaverhill L.
Nicholson L.
Mosquito L.
Yathkyed L.
Quartzite L.
WHALE COVE
Jim L.
Sid L.
Markham L.
Kamilukuak L.
Kazan River
Carr L.
Kaminak L.
Dubawnt River
Kamilukuak River
Maguse River
Maguse L.
North Henik L.
Amato L.
South Henik L.
ESKIMO POINT

Figure 5. Locations of post-calving Kaminuriak caribou observed during the 1981 Monitoring Program.[1]


Legend
Caribou Protection Areas
Thelon Game Sanctuary Boundary
Kaminuriak Post-Calving Migration
Kaminuriak Calving Ground (May 29 - June 13)
Beverly Calving Ground (May 23 - June 15)
Boundaries Are Approximate


104°
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61°
100°
98°
Upper Garry L.
Lower Garry L.
Petty L.
Amer L.
Woodburn L.
Back River
Contwoyto River
Upper Contwoyto
Sand L.
Naujatuuq L.
Sahara L.
Itza L.
Tehek L.
Whitehills L.
Schultz L.
River
Judge Sissons L.
Long L.
BAKER LAKE
Baker L.
Bowell Is
Chesterfield Inlet
Christopher Is
Pitz L.
Princess Mary L.
Aberdeen L.
Marjorie L.
Beverly L.
Thelon
Islands
Lookout Point
Wharton L.
Bissett L.
Gibson
Parker L.
MacQuoid L.
Peter L.
Banks L.
Farde L.
Mallery L.
Kaminuriak L.
RANKIN INLET
Ferguson L.
Duffy L.
Yathkyed L.
Victory L.
Happatiyik L.
WHALE COVE
Quartzite L.
Eskimo River
Carr L.
Kaminak L.
Tulemalu L.
Dubawnt L.
Eyeberry L.
Beaverhill L.
Nicholson L.
Mosquito L.
Kamilukuak L.
Markham L.
Jim L.
Sid L.
Yazan River
Imiluta L.
Padlei
Maguse
Maguse L.
North Henik L.
Ameto L.
South Henik L.
ESKIMO POINT
Dubawnt River
Kamilukuak River
Ingalik River
Clarke River
Sunshine River

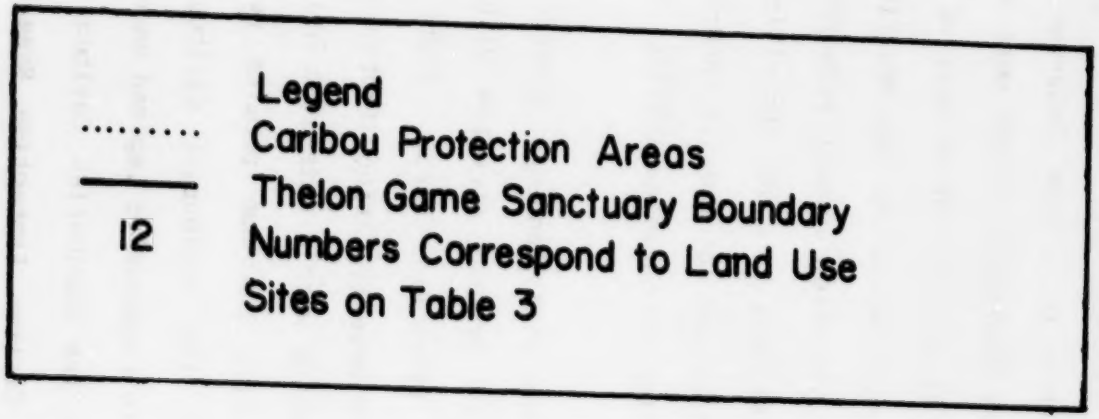
and calves (G. Alikut pers. comm.), however, juveniles and bulls were also present. They were estimated to be travelling approximately 10 km/day (G. Alikut pers. comm.). In mid-July, pilots and exploration personnel reported mixed concentrations of caribou south of Thirty Mile Lake, between Forde Lake ($63^{o}20'$ N, $96^{o}20'$ W) and Ferguson Lake.

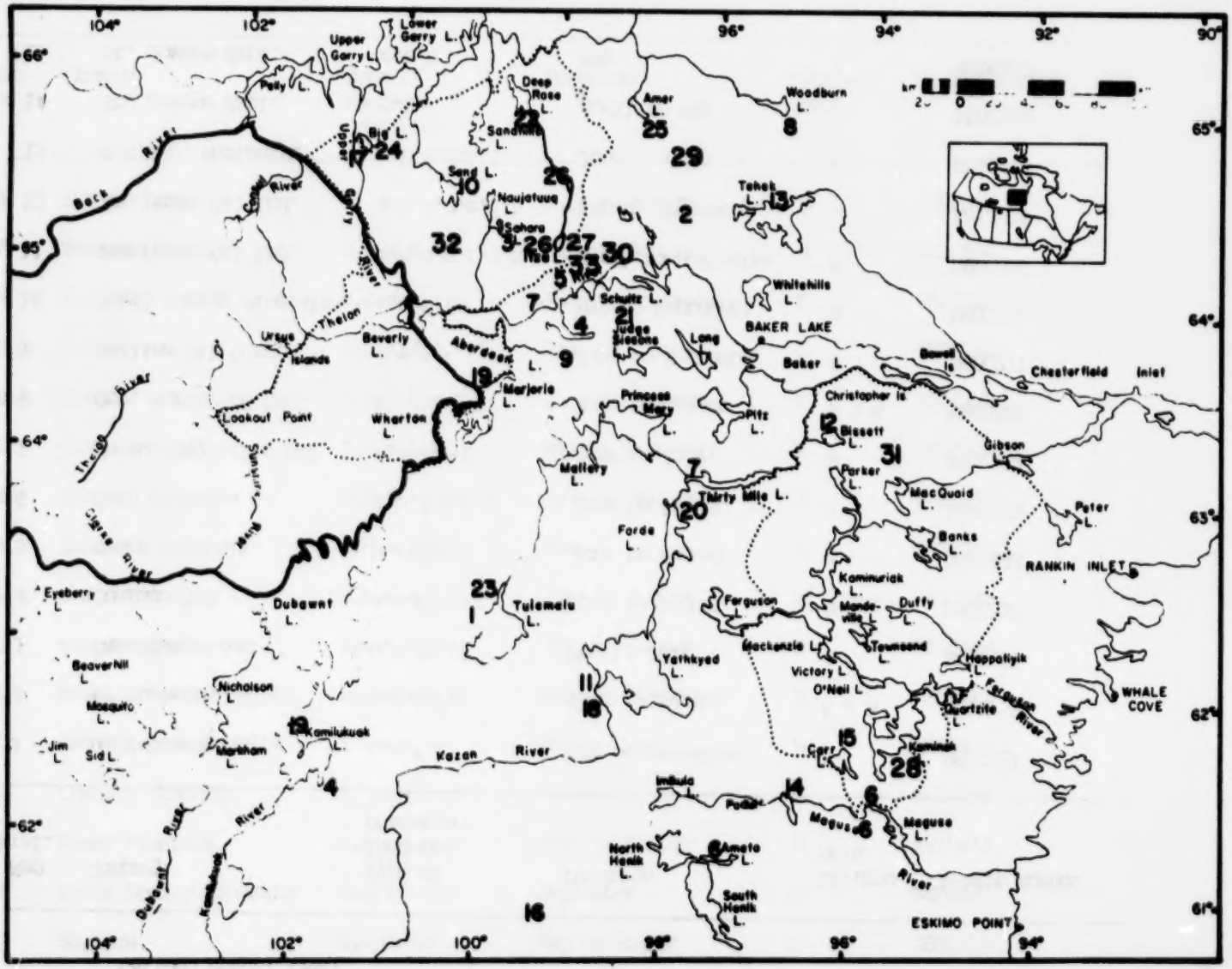
LAND-USE ACTIVITIES

During the 1981 spring and summer season, 33 land-use operations of sufficient size to require land-use permits were conducted within the ranges of the Beverly and Kaminuriak caribou herds (Fig. 6, Table 3). Some land-use operations conducted outside the Caribou Protection Areas were monitored while flying to and from areas of concern, or as part of a land-use inspection flight. Others were identified and described through interviews with pilots and exploration company personnel. In addition there were smaller operations, or other activities within the ranges of the two herds, which did not require land-use permits. There was little documentation of these activities, which are usually short term.

Most of the 1981 land-use operations of concern to the Caribou Monitoring Program occurred within or adjacent to the Beverly Caribou Protection Area. Eight land-use permits were issued within the Beverly Caribou Protection Area. All companies and agencies working within this area had been granted a release by 14 July. Five land-use permits were issued to companies exploring within the Kaminuriak Caribou Protection Area. No restrictions were required or imposed under the Caribou Protection Measures within the Kaminuriak Caribou Protection Area. As a result of the Caribou Protection Measurues and the Monitoring Program, potential caribou - land-use conflicts were avoided.

Figure 6. Land-use permit locations within the ranges of the Beverly and Kaminuriak herds, 1981.




Upper Garry L.
Lower Garry L.
Petty L.
Deep Rose L.
Amer L.
Woodburn L.
Big L.
Sandhills L.
Sand L.
Nauja tuuq L.
Schare L.
Tehek L.
Back River
Thelon River
Whitehills L.
Schultz L.
Judge Sissons
Long
BAKER LAKE
Baker L.
Bowell Is
Chesterfield Inlet
Christopher Is
Ursus Islands
Beverly L.
Aberdeen L.
Marjorie L.
Princess Mary L.
Pitz L.
Bissett L.
Gibson
Lookout Point
Wharton L.
Mallery L.
Parker L.
MacQuoid L.
Thirty Mile L.
Peter L.
Forde L.
Banks L.
RANKIN INLET
Kaminuriak L.
Eyeberry L.
Dubawnt L.
Tulemalu L.
Ferguson L.
Mandeville L.
Duffy L.
Mackenzie L.
Townsend L.
Yathkyed L.
Victory L.
O'Neil L.
Happaliyik L.
WHALE COVE
Beaver Nil L.
Nicholson L.
Mosquito L.
Quartzite L.
Ferguson River
Jim L.
Sid L.
Kamilukuak L.
Markham L.
Kazan River
Gorr L.
Kaminak L.
Imbuia L.
Padlei
Maguse L.
North Henik L.
Ameto L.
South Henik L.
ESKIMO POINT
104°
102°
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64°
63°
62°
61°

Table 3. Land-use activity summary of operations within the ranges of the Beverly and Kaminuriak caribou herds, 1981.

Map ref.	Company	Type of land-use operation	Duration	Caribou herd	Permit number
1	AGIP Canada Ltd.	c,e,f,g	May to September	K	N81C523
2	BP Minerals Ltd.	c,d,e,f,h	June to August	K & B	N81C553
3	Canadian Nickel	b,c,d,e,f	May to July	B	N81C456
4	Cominco Ltd.	c,e,f,h	June to August	B	N80C225
5	Essex Minerals	c,e,f,g,h	June to August	B	N81C423
6	Esso Minerals	a,b,d,e,f,g	June to August	K	N80C219
7	Hudson Bay Oil & Gas	a,c,d,e,f	June to July	B	N81C454
8	Geo. Survey of Can.	f	June to August	K & B	N80H380
9	Marline Oil Corp.	c,e,h	June to September	B	N80C277
10	Mobil Energy Minerals	c,e,f	May to September	B	N80C390
11	Pan Ocean Oil Ltd.	b,c,d,e,f,g,h	April to September	K	N80C386
12	Pan Ocean Oil Ltd.	a,b,c,d,e,f,h	May to September	K	N81J426
13	S.E.R.U. Nucleaire	a,b,c,d,e,f	June to July	K	N81C477
14	St. Joseph Expl.	c,h	April to May	K	N80C328
15	St. Joseph Expl.	c,e,h	May	K	N80C407

Table 3. continued

Map ref.	Company	Type of land-use operation	Duration	Caribou herd	Permit number
16	Suncor Inc.	f	July to August	K	N81J497
17	Texasgulf Inc.	a,c,e,f	July to August	B	N81C506
18	U.G.**	b,c,d,e,f,g	June to September	K	N81C541
19	U.G.	a,b,c,d,e,f,h	June to July	K	N80C240
20	U.G.	a,b,c,d,e,f,g	June to August	K	N81C471
21	U.G.	c,d,e,f,g	May to September	K	N81C544
22	U.G.	c,d,f	June to August	B	N80C217
23	Union Oil Co.	c,d,e,f,g	June	K	N80C241
24	Union Oil Co.	a,b,c,d,e,f,g	July to August	B	N80C242
25	Uranerz Expl.	a,e,	July to August	B	N81C458
26	Westmin Resources Ltd.	a,d,e,f,h	June to September	B	N80C412
27	NWT Wildlife Service	i	May to June	B	N81H495
28	Chevron Standard	f, mapping	August to September	K	N81J546
29	Essex Minerals	e,f	June to August	B	N81C424
30	Mobil Energy Minerals	c,e,f	September	B	N80C403
31	Noranda	b,c,d,e,f	May to August	K	N80C379

Table 3. continued

Map ref.	Company	Type of land-use operation	Duration	Caribou herd	Permit number
32	S.E.R.U. Nucleaire	b,c,d,e,f	August	B	N80C246
33	U.G.	f	May to September	B	N80C236

* Refer to Fig. 6
** Urangesellschaft Canada Ltd.
a Air geophysics
b Reconnaissance geochemistry
c Ground geophysics
d Ground geochemistry
e Geology
f Prospecting
g Trenching
h Diamond drilling
i Caribou research
B Beverly caribou
K Kaminuriak caribou

Land-use Permits

Urangesellschaft Canada Ltd. N80C217

Urangesellschaft applied for a release of a work site south of Deep Rose Lake on 30 June. A release was denied based on observations of caribou made during the 28 June flight (Table 1). No caribou were observed in this area during a subsequent flight on 6 July. The Monitor recommended release of the site, which was granted by DIAND on 7 July.

Union Oil Company of Canada Ltd. N80C242

Union Oil submitted a request for release of a site near Big Lake on 8 July. The request was denied because of large concentrations of caribou that were observed by the Monitor in the Sand Lake and Deep Rose Lake area during a flight on 28 June (Table 1). The Monitor recommended release of this site on 13 July based on observations that indicated the absence of caribou (Table 1). DIAND released the site on 14 July.

Mobil Energy Minerals Canada Ltd. N80C390

On 6 May, Mobil notified the Land-use Inspector of the company's intent to establish a camp near Sand Lake; a camp was established between 12-13 May in preparation for a summer program. The company applied to re-enter the camp to complete preparations for summer work beginning 1 July. Based on observations of caribou in the area, the Monitor recommended that a release not be granted. Thousands of cows and calves were observed in this area

on 6 July; however, by 13 July the caribou had moved out of the Sand Lake area (Table 1.) The Monitor recommended release of this area which was granted by DIAND on 14 July.

Westmin Resources N80C412

Westmin requested a release for a work camp at Itza Lake (65°02' N, 98°27' W) on 7 May. DIAND granted the release on 13 May.

Hudson Bay Oil and Gas Co. Ltd. N81C454

Hudson Bay operated two camps; one was located on the east arm of Aberdeen Lake (64°30' N, 99°00' W) and the other east of Sand Lake. The land-use operation at Aberdeen Lake was outside the Caribou Protection Area and not used by Beverly cows. No closures were required by DIAND. A request for a release to commence on 1 July was submitted for reconnaissance work east of Sand Lake. This request was denied because caribou were in the area. No caribou were observed in this area during a monitoring flight on 6 July (Table 1). The Monitor recommended release, which was granted by DIAND on 7 July.

Canadian Nickel Company Ltd. N81C456

On 12 May, Canadian Nickel contacted DIAND and requested a release to conduct land-use operations in the Sahara Lake (65°02' N, 99°02' W) area. The release was granted on 14 May based on information submitted by the Monitor on that day.

Government of the Northwest Territories Wildlife Service N81H495

The GNWT Wildlife Service requested a release for their research camp at Itza Lake beginning 23 May. DIAND granted a release on 21 May.

Texasgulf Inc. N81C506

Texasgulf submitted a request for release of a site near Big Lake on 10 July. The request was denied because of large concentrations of caribou that were observed by the Monitor in the Sand Lake and Deep Rose Lake area during a flight on 28 June (Table 1). The Monitor recommended release of this site on 13 July based on observations that indicated the absence of caribou (Table 1). DIAND released the site on 14 July.

ACKNOWLEDGEMENTS

Funding to support this program was provided by DIAND.

I wish to thank Cormack Gates, John Donihee, Paul Gray and Kim Poole for the administrative assistance they provided during the 1981 monitoring season. Roy Bullion, Baker Lake Wildlife Officer, provided initial orientation to Baker Lake as well as advise on field logistics. Steve Cooper provided background information about the program. Noak Tiktak was the Assistant Caribou Monitor. Dr. Anne Gunn contributed information on movements during the monitoring period.

Mike Piroyouak provided liaison between the Hunters' and Trappers' Association and the monitor. Mike and several other residents of Baker Lake contributed valuable information on caribou movements.

Jim Umpherson (DIAND) and Mike Kusugak (DIAND) provided orientation to the land-use permit system and baseline information on land-use operations in the Keewatin. DIAND Land-use Inspector Joan Scottie provided information on various land-use activities within her area.

Monitoring flights were completed from fixed wing aircraft supplied by Keewatin Air Ltd. and the DIAND land-use helicopter. Several pilots provided information on caribou movements and greatly added to the information base. The Hamlet of Baker Lake provided a comfortable home base and logistical support.

PERSONAL COMMUNICATIONS

Alikut, G. Wildlife Officer, N.W.T. Wildlife Officer, Eskimo Point, N.W.T.

Decker, R. A.L.U.R. Technician, N.W.T. Wildlife Service, Yellowknife, N.W.T.

Gates, C. Regional Biologist, N.W.T. Wildlife Service, Rankin Inlet, N.W.T.

Gunn, A. Caribou Biologist, N.W.T. Wildlife Service, Yellowknife, N.W.T.

Umpherson, J. District Manager, Northern Affairs Program, DIAND, Rankin Inlet, N.W.T.

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Fleck, E.S. and A. Gunn. 1982. Characteristics of three barren-ground caribou calving grounds in the Northwest Territories. N.W.T. Wildl. Serv. Prog. Rep. No. 7. 158 pp.

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APPENDIX I

Caribou Protection Measures, 1981

CARIBOU PROTECTION MEASURES, 1981

****

1. (a) The Permittee shall not, without approval, conduct any activity between May 15 and July 31 within the Caribou Protection Areas depicted on the map certified by the Engineer as the "Caribou Protection Map 1980", annexed to this Land-use Permit. CARIBOU PROTECTION AREAS

(b) A Permittee may, upon approval by the Land-use Inspector, operate within the said Caribou Protection Areas beyond the May 15 deadline set out in 1(a), provided that when monitoring information indicates that caribou cows are approaching the area of operation, the Permittee will implement 1(c).

(c) On cessation of activities pursuant to 1(a) or 1(b), the Permittee will remove all personnel from the zone who are not required for the maintenance and protection of the camp facilities and equipment unless otherwise directed by the Land-use Inspector.

(d) The Permittee may commence or resume activities prior to July 31 within those parts of the Caribou Protection Areas released by the Land-use Inspector for the reason that caribou cows are not expected to use those parts for calving or post-calving (Note 1).

2. (a) In the event that caribou cows calve outside of the Caribou Protection Areas, the Permittee shall suspend operations within the area(s) occupied by cows and/or calves between May 15 and June 30. CARIBOU PROTECTION GENERAL

(b) In the event that caribou cows and calves are present outside of the Caribou Protection Areas, the Permittee shall suspend the following operations within the area(s) occupied by cows and calves between July 1 and July 31.

(i) airborne geophysical surveys at an altitude of less than 300 m above ground level.

(ii) slinging of fuel or equipment by helicopter at an altitude of less than 300 m above ground level (Note 2).

3. (a) During migration of caribou, the Permittee shall not locate any operations so as to block or cause substantial diversion to the migration. CARIBOU PROTECTION MIGRATION

(b) The Permittee shall cease activities that may interfere with migration, such as airborne geophysical surveys or movement of equipment, until the migrating cows have passed.

4. (a) The Permittee shall not, between May 15 and September 1, construct any camp, cache any fuel or conduct any blasting within 10 km of any "Designated Crossing Site" as outlined on the map certified by the Engineer as the "Caribou Protection Map 1980", and annexed to this Land-use Permit. CARIBOU CROSSINGS

(b) The Permittee shall not, between May 15 and September 1, conduct any diamond drilling operation within 5 km of any "Designated Crossing Site" as outlined on the map certified by the Engineer as the "Caribou Protection Map 1980" and annexed to this Land-use Permit.

Note

1. The Land-use Inspector's decision will be made on the basis of the existing caribou monitoring information.

2. Concentrations of caribou should be avoided by low level aircraft at all times.

APPENDIX II

Caribou Monitoring Procedures

GUIDELINES FOR THE CARIBOU MONITOR

Various decisions to be made by the Land-use Inspector will require input from the Caribou Monitor. Advice on releasing specific areas for exploratory activities before or after occupation by calving cows will no doubt be the most difficult to address. The guidelines below are given for guidance and consideration by the Monitor in order to assist him/her in interpreting potential caribou-man interactions.

a) Releases prior to arrival of calving cows.

Within Protection Areas, exploratory activities have to stop by 15 May unless a release from the Land-use Inspector is granted on the advice of the Caribou Monitor. The Monitor should only recommend approval for a deadline extension when the camp is located in a peripheral part of the Protection Areas that is usually the last to be occupied by pregnant cows. When the spring migration is being monitored, the Monitor should not try to predict the different dates of arrival for caribou at the individual camps since monitoring during the past three years has shown this to be impossible. Instead, the Monitor should be conservative. The Monitor should advise the Land-use Inspector to close down remaining camps in the Protection Areas on the same date, a minimum of three days before the cows are expected to arrive in the area of the camps.

b) Release of Land-use activities before and during calving outside Protection Areas

Although Protection Areas contain the calving grounds, calving may occur outside their boundaries. If the Monitor thinks that a segment of pregnant cows are moving toward an exploration site, he/she should immediately advise the Land-use Inspector that a problem is pending. Normally, three days are required to close down a camp. In some instances, however, it may be necessary to shut down a camp immediately should the pregnant cows be first observed closer than 5 km. If the caribou are more than three days travel away from any site when first observed, the Monitor should estimate the minimum time of travel to within 5 km of that camp and accordingly advise a closure date to the Land-use Inspector. (Caribou movement rates are based on 30 miles per day.) In all instances, it is important to be conservative and to remember that the area of "suspended operations" moves in advance of the caribou.

(c) Releases of Land-use activities after calving in Protection Areas

Decisions allowing exploration activities to start up again that were shut down during calving will require the advice of

the Caribou Monitor. Such advice should be provided by carefully checking the area around the activity site for herds of caribou. By careful evaluation of the camp site in relation to known areas of caribou use (i.e. water crossings) and in relation to number of caribou more than 5 km away, the Monitor can guess the possible direction of caribou movement. If there is not a segment within three days travel, the Monitor can advise a release for the activity site on the provision that the camp be closed should the caribou return to within 5 km before July 31.

(d) Releases of Land-use activities after calving outside Protection Areas

After June 30, only certain activities based from camps can be cancelled by movements of caribou. Particular attention should be paid to airborne geophysical surveys and slinging of loads by helicopter for caribou disturbance. The Monitor should use the same conditions as in (b).

APPENDIX III

Flight Report Forms and Maps

CARIBOU MONITORING FLIGHT REPORT FORM

Kaminuriak Beverly Date: _____

Aircraft _____ Pilot _____

Weather: Cloud _____ Temperature _____

Wind _____ Visibility _____

% Snow Cover _____ Lakes/Rivers Frozen _____

Comments _____

_____

_____

Survey Type: Reconnaissance _____ Transects _____ Other _____

Altitude(s) _____ Air Speed _____

Names and Duties of Observers:

1. Assistant Monitor _____
2. Observe only _____
3. Photograph _____
4. Others _____

Distance flown _____ Hours flown _____

Location(s): Maps used NTS 1:250,000 _____

Purpose of flight (Land-use Permit #'s): _____

_____

_____

Vegetation types: Trees _____, Treeless Tundra _____, Shrubby Tundra _____,
Dwarf Tundra _____, Tundra _____.

Water Crossings Noted: _____

_____

Human Activities Noted: _____

_____

_____

_____

FLIGHT REPORT FORM (cont'd)

Aerial Survey _____ Ground Survey _____

Comments on survey and caribou activity: _____

Proposed next aerial survey and/or ground observations _____

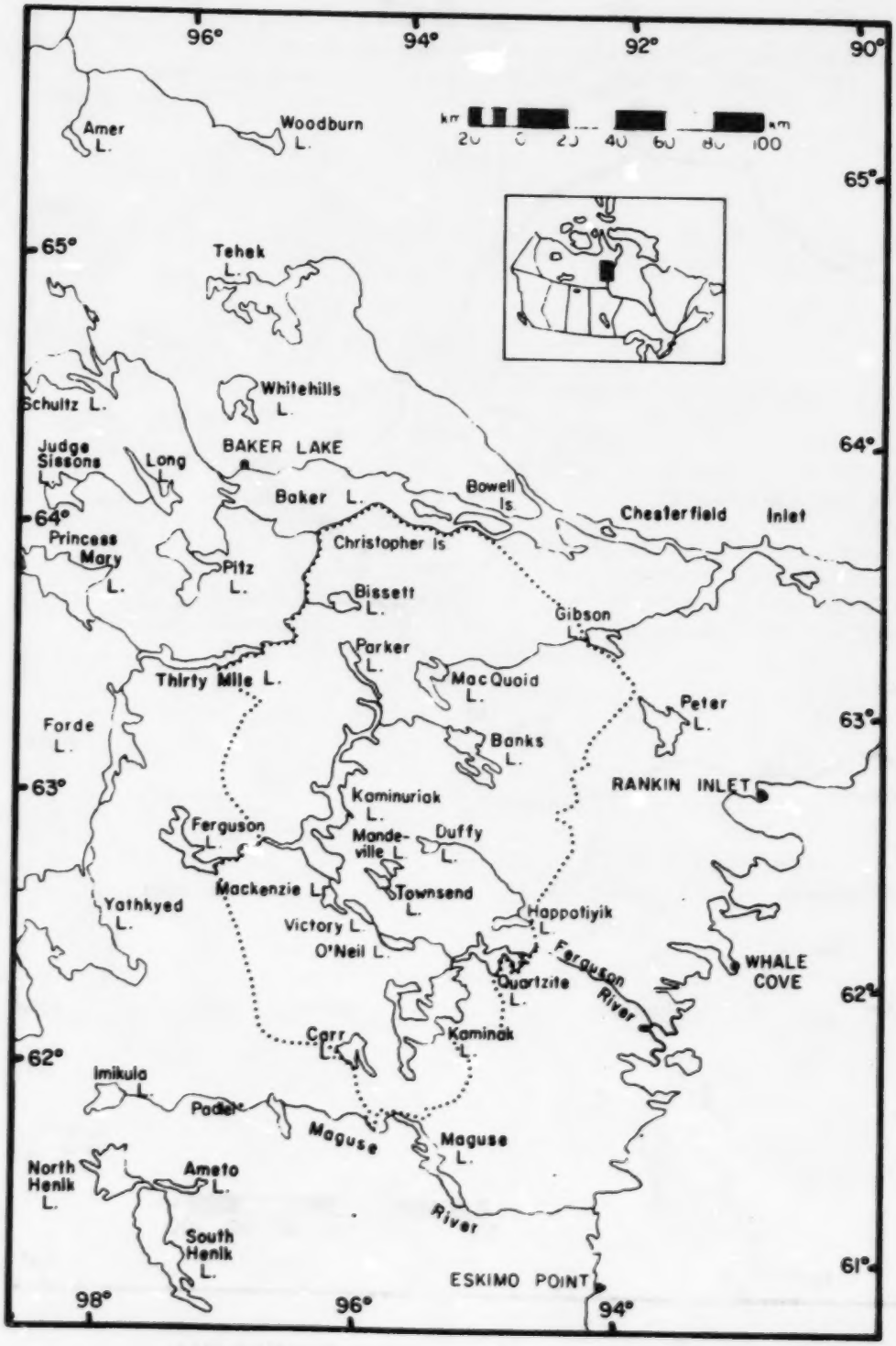
Submitted by: _____

CARIBOU CLASSIFICATION FORM

Approximate Area Date

Cows with Antlers	Others*	Cows with Calves	Unclass-ified	Mature Bulls	Group Number

*Other - juveniles, barren cows, antlerless pregnant cows, yearlings.


96°
94°
92°
90°
65°
64°
63°
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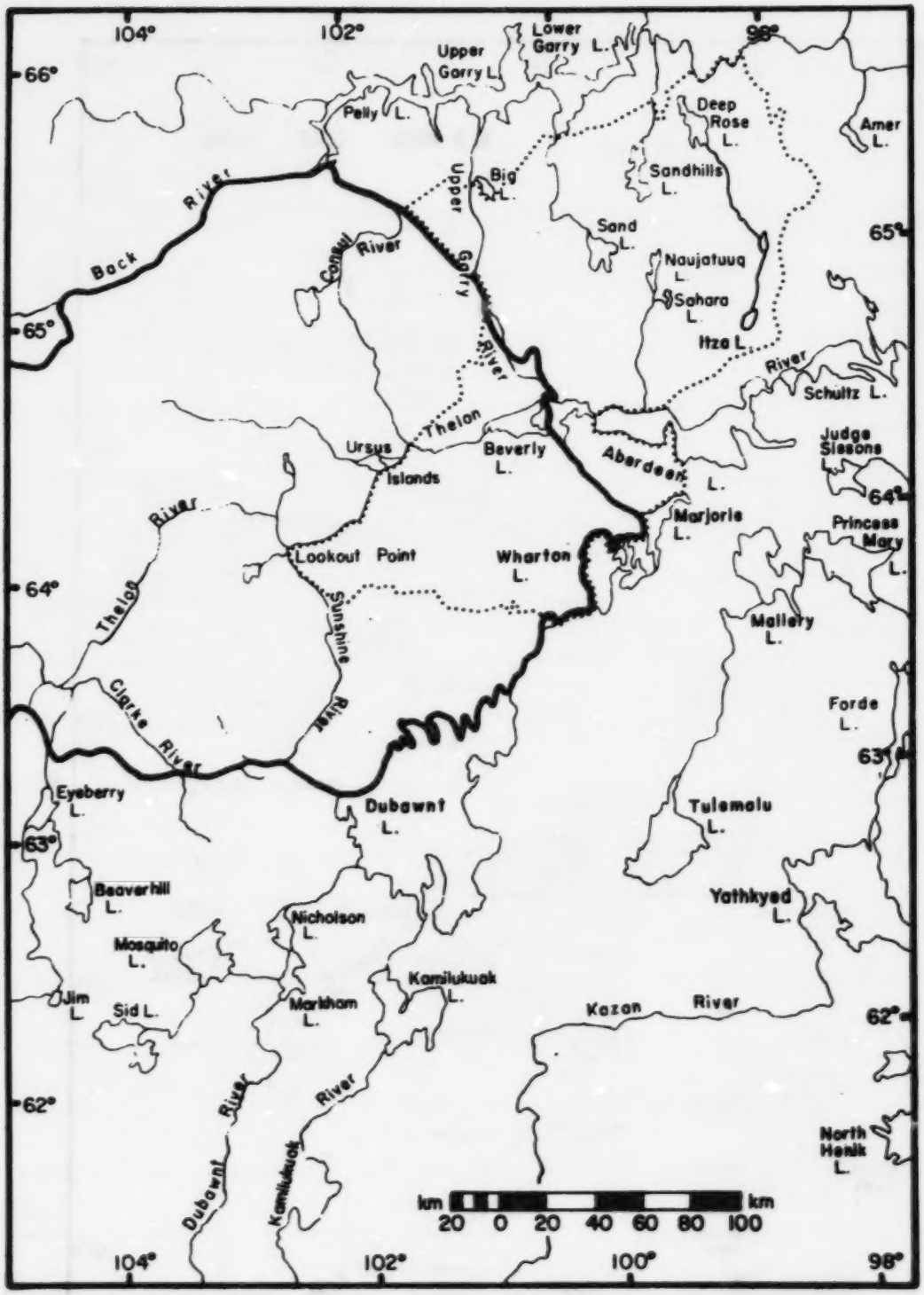
98°
km
20 0 20 40 60 80 100
km
Amer L.
Woodburn L.
Tehek L.
Whitehills L.
Schultz L.
Judge Sissons L.
Long L.
BAKER LAKE
Baker L.
Bowell Is
Chesterfield Inlet
Princess Mary L.
Pitz L.
Christopher Is
Bissett L.
Gibson L.
Parker L.
Thirty Mile L.
MacQuoid L.
Peter L.
Forde L.
Banks L.
RANKIN INLET
Kaminuriak L.
Ferguson L.
Mandeville L.
Duffy L.
Mackenzie L.
Townsend L.
Yathkyed L.
Victory L.
Happotiyik L.
O'Neil L.
Ferguson River
WHALE COVE
Quartzite L.
Carr L.
Kaminak L.
Imikula L.
Padlei
Maguse
Maguse L.
North Henik L.
Ameto L.
River
South Henik L.
ESKIMO POINT



Caribou Monitoring Flight Summary Map—Beverly Caribou Protection Area.

ERRATA

Cooper, S. 1981. Beverly and Kaminuriak caribou monitoring and land use controls, 1980. N.W.T. Wildl. Serv. Prog. Rep. No. 4. 74 pp.

Page 7 (Table 1)

Omit "DIAND released Western Mines at Sandhills Lake, (unknown to Monitor). U.G. was not released."

Pages 62-63

Replace "Western Mines Ltd. applied to DIAND... was advised."

With "Western Mines Ltd. applied to DIAND on 9 June for a release to establish a fly camp 29 km north of Aberdeen Lake to be occupied by four men. Approval was given to establish the fly camp based on N.W.T. Wildlife Service calving ground census information of 5, 6 and 8 June. The camp was occupied from 11 June to 26 August. No caribou - land-use conflicts occurred."